

ONLINE REPOSITORY MATERIALS

Table E1. Sampling, baseline participation, and 6-month follow-up weights by EHR selection groups and race/ethnicity used for estimation of prevalence of transition states in source population

EHR Selection Groups^a	Race/ethnicity	Source, n	Mailed Baseline, n	Proportion Mailed Baseline (x1)	Returned Baseline, n	Proportion Returned Baseline (x2)	Returned 6-month Follow-up, n	Proportion Returned Follow-up (x3)	Analysis Weights^b
CRS codes	White	13,132	12,209	0.92971	4730	0.38742	3095	0.65433	4.24301
	Black	170	159	0.93529	35	0.22013	17	0.48571	9.99994
	Hispanic	192	181	0.94271	35	0.19337	19	0.54286	10.10520
	Total	13,494	12,549	0.92997	4800	0.38250	3131	0.65229	4.30982
Asthma or allergy codes	White	47,892	4224	0.08820	1489	0.35251	955	0.64137	50.14774
	Black	991	903	0.91120	147	0.16279	69	0.46939	14.36232
	Hispanic	1035	966	0.93333	207	0.21429	93	0.44928	11.12873
	Total	49,918	6093	0.12206	1843	0.30248	1117	0.60608	44.68894
None of these codes	White	131,366	2775	0.02112	876	0.31568	554	0.63242	237.16654 ^c
	Black	2,832	1109	0.39160	160	0.14427	65	0.40625	43.57004
	Hispanic	3,159	1174	0.37164	168	0.14310	99	0.58929	31.90868
	Total	137,357	5058	0.03682	1204	0.23804	718	0.59635	191.32206
Total	White	192,390	19,208	0.09984	7095	0.36938	4604	0.64891	41.78665
	Black	3,993	2171	0.54370	342	0.15753	151	0.44152	26.44399
	Hispanic	4,386	2321	0.52918	410	0.17665	211	0.51463	20.78681
	Total	200,769	23,700	0.11805	7847	0.33110	4966	0.63285	40.42724

^a Primary care patients were selected and mailed to, based on evidence of CRS, asthma, and allergic conditions in EHR: CRS codes = two or more ICD-9 codes 471.x or 473.x or CPT codes for sinus surgery, sinus endoscopy or sinus CT; asthma or allergy codes = one ICD-9 code for 471.x or 473.x or two or more ICD-9 codes for asthma (493.x) or allergic rhinitis (477.x); none of these codes = does not meet criteria for above groups

^b Sample weight = 1/(x1*x2*x3)

^c This weight was untruncated for the prevalence estimates and truncated to 32.16387 for survey regression; sample weight = 1/(x1*x2) for survey regression

Abbreviations: CPT = Current Procedural Terminology; CRS = chronic rhinosinusitis; CT = computed tomography; EHR = electronic health record; ICD-9 = International Classification of Diseases

Table E2. Final latent class model consisting of nine questions with overall prevalence of an affirmative response in all subjects and the ratios of the prevalence of affirmative responses in latent class vs all subjects^a

Q#	Label	Prevalence in All Subjects	Pan-symptomatic ^b	Ratio ^c	CRS nasal and sinus symptoms ^b	Ratio ^c	Less frequent symptoms ^b	Ratio ^c	Headache symptoms ^b	Ratio ^c
q16	Both blocked	0.1027	0.6429	6.26	0.3535	3.44	0.0200	0.19	0.1040	1.01
q20	Blow nose 10+ times	0.1606	0.6903	4.30	0.5484	3.42	0.0464	0.29	0.1723	1.07
q23	Lump in throat	0.1370	0.7897	5.77	0.4050	2.96	0.0299	0.22	0.2114	1.54
q25	Not smell anything	0.0645	0.3687	5.71	0.1885	2.92	0.0255	0.39	0.0468	0.73
q27	Facial pain 5+	0.0763	0.7167	9.39	0.1076	1.41	0.0084	0.11	0.2158	2.83
q40	Eye itching	0.1281	0.6295	4.91	0.2833	2.21	0.0419	0.33	0.2598	2.03
q72	Wheeze, tight, whistle with cold	0.0611	0.4359	7.14	0.1270	2.08	0.0165	0.27	0.1151	1.88
q83	HA photophobia	0.1308	0.7117	5.44	0.0371	0.28	0.0417	0.32	0.5252	4.01
q89	Fatigue interferes	0.1943	0.7733	3.98	0.2785	1.43	0.0728	0.37	0.5572	2.87
	<i>Number (%) in class</i>		246 (3.3%)		941 (12.6%)		5508 (73.8%)		773 (10.4%)	

^a Latent class analysis: final model with four latent classes using five secondary CRS questions and one each for allergy, asthma, migraine, and fatigue. This analysis allowed identification of four latent classes namable as pan-symptomatic, CRS nasal and sinus symptoms, less frequent symptoms, and headache symptoms.

^b Percentages with affirmative response

^c Divides prevalence in class by overall prevalence; highlighted cells support the conclusion about what the latent class represents, consistent with the way each latent class was named.

Abbreviations: CRS = chronic rhinosinusitis; HA = headache; Q = question

Table E3. Selected demographic variables by categories of follow-up status (current vs. not current CRS) on the 6-month questionnaire by baseline status (current, past, and never), resulting in six longitudinal symptom subgroups^a

Characteristic ^b	CRS Current at Baseline n = 1143		CRS Past at Baseline n = 1249		CRS Never at Baseline n = 2344	
	Follow-up Status Current CRS n = 558	Follow-up Status Not Current CRS n = 585	Follow-up Status Current CRS n = 190	Follow-up Status Not Current CRS n = 1059	Follow-up Status Current CRS n = 83	Follow-up Status Not Current CRS n = 2261
Group label	Persistent	Non-persistent	Recurrent	Stable past	Incident	Never
Age of onset (vs. 0-15 years) ^c						
0-15 years, n = 615	21.4	18.5	23.1	19.8	16.7	16.0
16-30 years, n = 1087	35.7	36.0	34.6	34.0	25.0	29.4
31-45 years, n = 769	22.9	26.7	24.7	23.8	28.3	22.5
46-60 years, n = 547	14.8	12.6	14.8	17.4	18.3	20.1
>60 years, n = 240	5.3	6.3	2.8	5.0	11.7	12.2
Hay fever, physician-diagnosed, n = 2222	56.5	56.8	56.3	53.6	39.8	34.8
Asthma, physician-diagnosed, n = 1246	29.8	35.9	34.4	31.5	19.5	18.8
Asthma, symptom based ^d , n = 1777	63.0	57.1	49.5	39.6	21.4	35.7
Migraine headache ^e , n = 1005	49.3	40.5	34.1	23.9	28.8	10.9
Any treatment ^f , n = 3620	92.1	92.0	92.5	86.3	79.0	56.7
Intranasal steroid, n = 2210	68.0	64.8	64.8	57.5	48.8	28.4
Intranasal anti-histamine, n = 582	21.7	23.9	21.2	13.6	12.8	5.4
CRS surgery at baseline, n = 690	24.4	20.9	21.6	23.0	6.0	5.4
LCA class at baseline ^g , n = 1374						
Less frequent symptoms	19.1	28.6	17.5	45.7	17.7	66.8
Pan-symptomatic	22.4	9.6	0	1.6	0	0
Headache symptoms	17.4	19.8	39.7	28.7	52.9	23.3
CRS nasal and sinus symptoms	41.2	42.0	42.0	24.0	29.4	9.9
CRS EPOS subgroup at baseline, n = 1195						
OBS/DC, n = 418	27.2	42.2	-	-	-	-
PP, n = 427	36.6	35.2	-	-	-	-
SL, n = 217	21.9	14.2	-	-	-	-
PPSL, n = 133	14.3	8.4	-	-	-	-
Minor CRS symptoms quartiles ^h , n = 4948						
Q1, n = 1330	4.7	4.3	9.6	16.0	23.2	44.0
Q2, n = 1371	12.0	15.9	21.3	33.3	28.0	32.8
Q3, n = 1089	24.8	30.1	29.8	28.9	24.4	15.6
Q4, n = 1158	58.5	49.7	39.3	21.8	24.4	7.7
Lower respiratory symptoms quartiles ⁱ , n = 4923						
Q1, n = 1712	15.5	20.0	21.8	32.2	31.7	45.8

Q2, n = 764	12.8	11.0	13.3	15.8	20.7	17.4
Q3, n = 1166	23.4	26.5	26.6	24.9	23.2	22.4
Q4, n = 1281	48.3	42.5	38.3	27.1	24.4	14.4
Allergy symptoms quartiles ^d , n = 4942						
Q1, n = 1616	9.0	11.6	19.1	25.3	31.7	48.0
Q2, n = 1219	17.5	19.0	20.7	28.5	23.2	26.8
Q3, n = 1406	36.3	40.5	32.5	34.1	28.0	20.5
Q4, n = 701	37.2	28.9	27.7	12.2	17.1	4.7
^a Unknown CRS status at 6-month follow-up questionnaire, n = 230						
^b Percentages are reported as column %						
^c Obtained from baseline questionnaire						
^d Some, most or all of the time to at least one of four questions- non-viral wheezing, nocturnal wheezing, exercise induced wheezing and non-viral nocturnal cough in the past 12 months						
^e Migraine was based on previously validated scale utilizing three questions- disability, nausea and light sensitivity with headache						
^f The treatment choices were antibiotics, oral and intranasal steroids, oral and intranasal anti-histamine, decongestants.						
^g Latent Class Analysis (LCA) to quantitatively evaluate symptom clustering, with final model having 9 questions- 5 CRS questions and 1 each for allergy, asthma, migraine, fatigue						
^h Headache, fevers, coughing, bad breath, fatigue, ear fullness, ear pain, and ear pressure in the past 3 months: take mean of the 5-point rating scale responses to these questions and quartile						
ⁱ Wheezing, chest tightness, shortness of breath in the past 3 months: take mean of the 5-point rating scale responses to these questions and quartile						
^j Nasal itching, sneezing, eye itching, eye tearing in the past 3 months: take mean of the 5-point rating scale responses to these questions and quartile						
<u>Abbreviations:</u> CRS = chronic rhinosinusitis; EPOS = European Position Paper on Rhinosinusitis; OBS/DC = obstruction and discharge only; PP = pain and/or pressure with at least one cardinal symptom (obstruction and or discharge); PPSL = pain and/or pressure, smell loss, and at least one cardinal symptom; SL = smell loss with at least one cardinal symptom						